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Photographic Intelligence Report

**NUCLEAR POWER PLANT
UNDER CONSTRUCTION,
NEAR VORONEZH, USSR**

VITAL RECORDS COPY



PIC/R-7/60

AUGUST 1960

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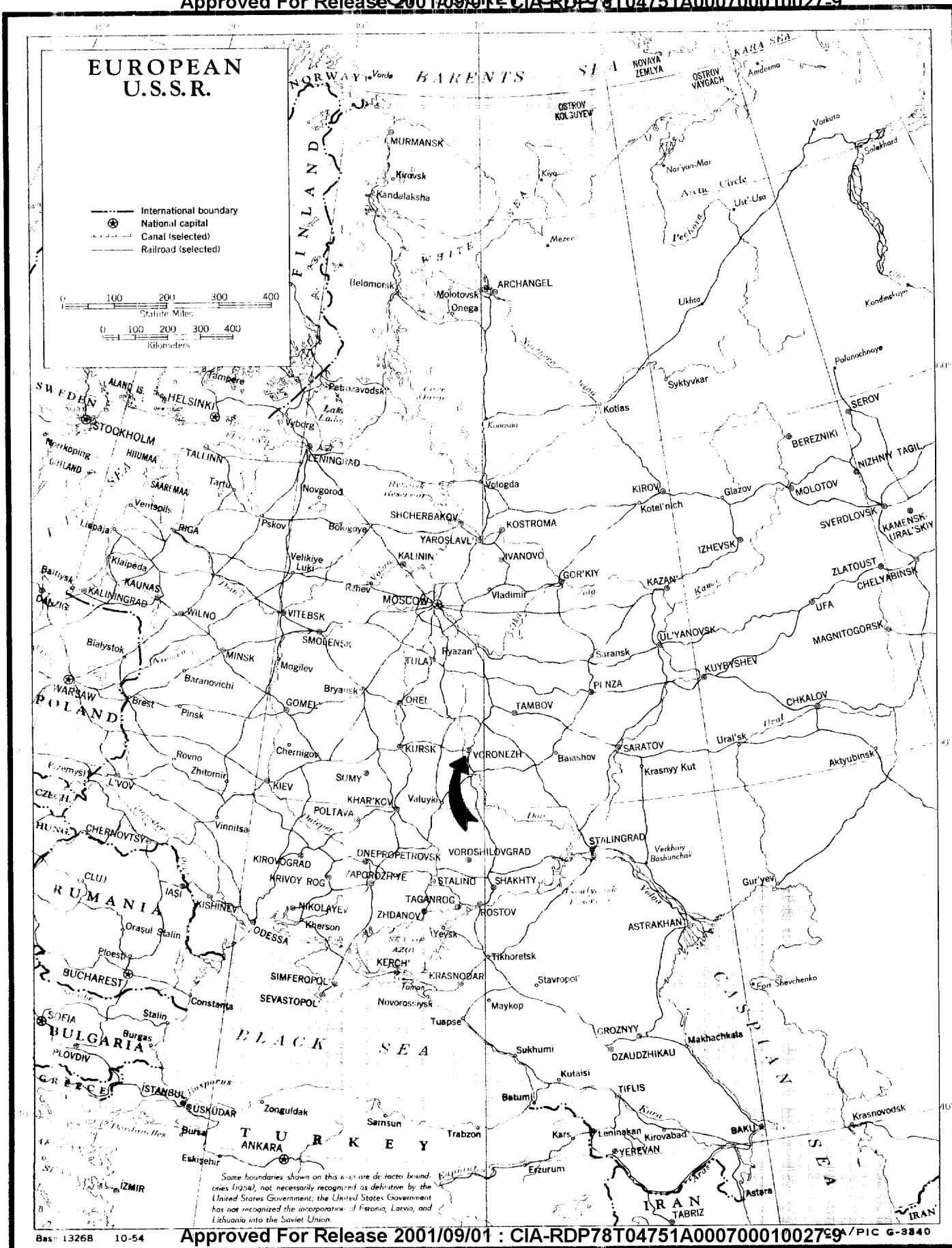
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INTRODUCTION

A nuclear power plant is under construction on the east bank of the Don River approximately 24 nautical miles (nm) south of Voronezh, at 51°16'N/39°12'E (see Figure 1). The new town of Novovoronezh, being built for the personnel associated with the power plant, is located approximately 3 nm north of the plant at 51°19'N/39°13'E.

The plant reportedly will consist of two water-moderated and water-cooled reactors with a capacity of 210,000 kw (electrical) each. 1/2/

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[REDACTED] Each reactor will provide steam for three 70,000 kw turbogenerators. Upon completion, the power station is scheduled to be connected to the unified power system which is being developed in European USSR. During any shutdowns of the reactor the nearby power network will supply the needed current. In emergency situations, storage batteries or a diesel-generator will be used to operate the reactor's control and safety system and other vital equipment.

GENERAL DESCRIPTION

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The Voronezh Nuclear Power Plant appears on good quality oblique photography of [REDACTED] (see Figure 2). It is located at the site of the former village of Dukhovskoye. The over-all dimensions of the plant area are approximately 5,500 by 3,000 feet.

A new road and rail spur connect the plant to Kolodeznaya Station on the main rail line running south from Voronezh (see Figure 1). The road and rail spur pass through the new town of Novovoronezh, located about 3 nm north of the power plant. There are several rail spurs within the plant area, and it is crisscrossed with numerous temporary roads and paths associated with the construction activities.

Construction of the power plant appears to be well advanced (see Figure 2). The outer shell of the first turbogenerator hall is nearing completion

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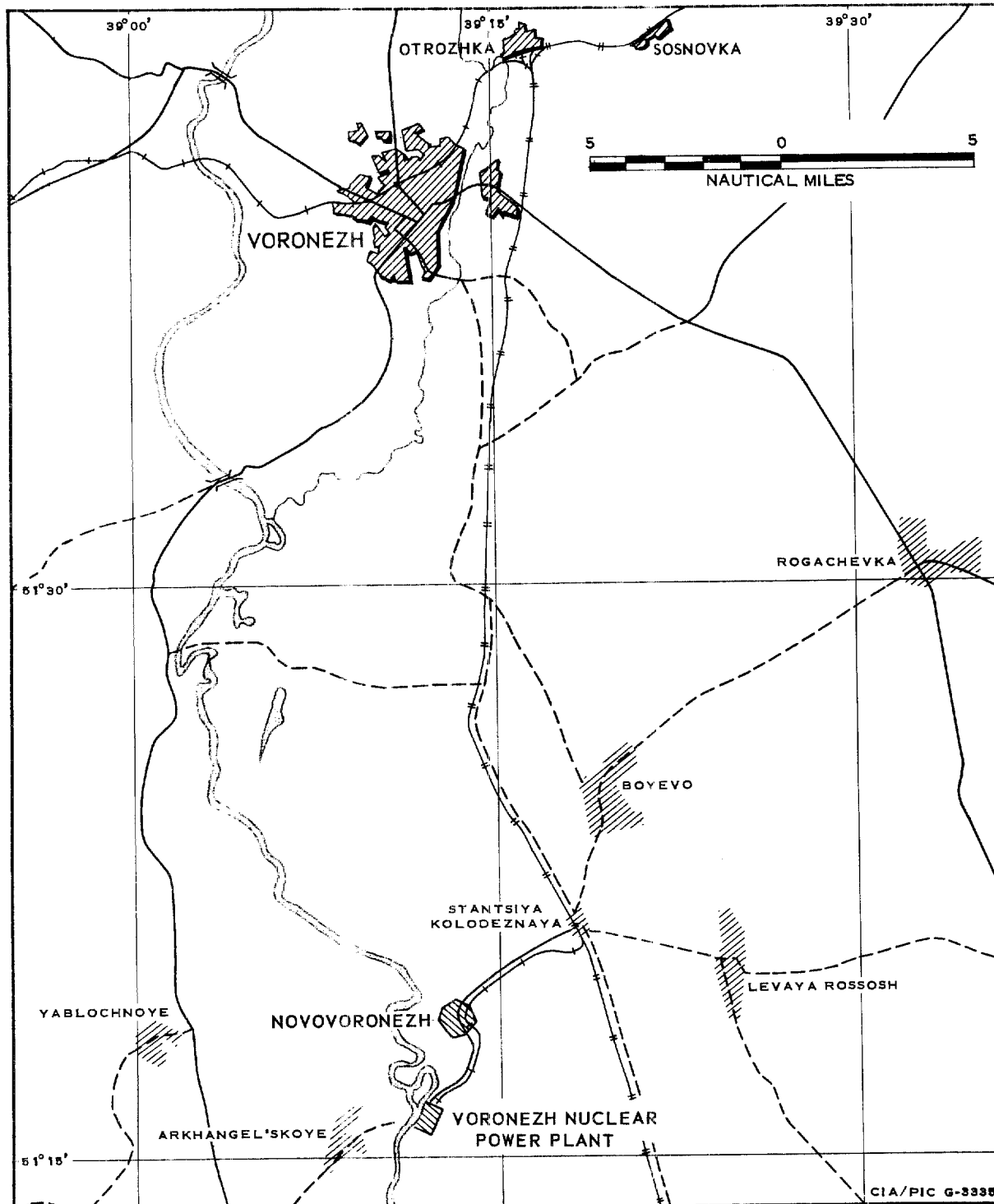


FIGURE 1. LOCATION OF THE VORONEZH NUCLEAR POWER PLANT.

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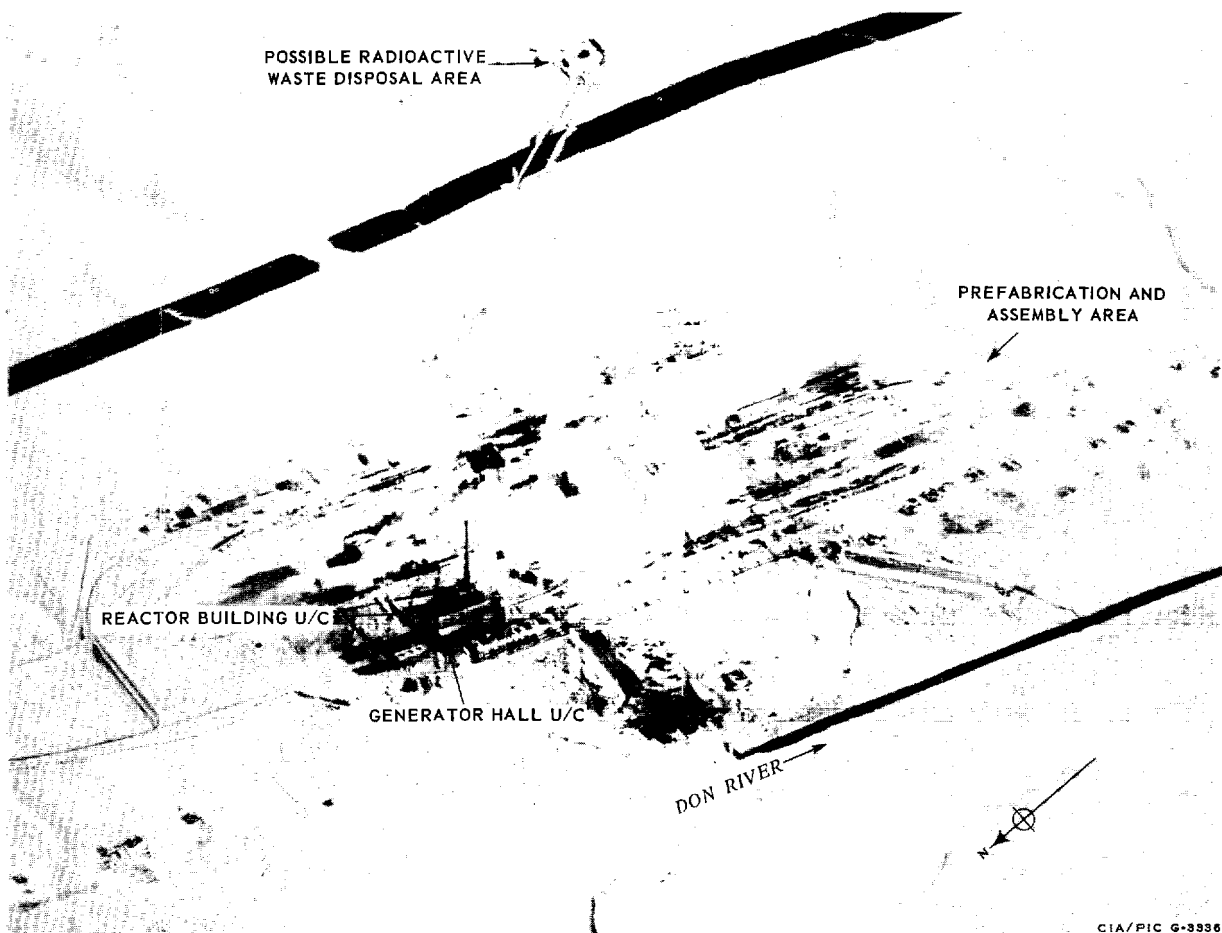



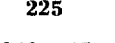
FIGURE 2. OBLIQUE VIEW OF THE VORONEZH NUCLEAR POWER PLANT. The scattered dwellings at either end of the plant are remnants of the former village of Dukhovskoye. Date of photography [REDACTED]

and considerable work has been done on the foundations for the first reactor. Shadow and obliquity hide most of the details of the reactor foundations, however. Immediately adjacent to these structures, some work has been done on the foundations for the second reactor building and generator hall. The cooling water intake and outlet system is under construction and a tall exhaust stack has been completed near the first reactor building.

A large area just south of the power plant contains several buildings, extensive open storage areas and a concrete batch plant (see Figure 3). Reportedly, many of the construction materials - such as precast concrete sections, steel roof trusses, and other items - are prefabricated and/or assembled in this area. 3/

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TABLE OF STRUCTURES

| Item No | Description | Approx Dimensions (feet) |
|---------|--|---|
| 1 | Two small unidentified structures, each | 50 x 45 |
| 2 | Tank in an excavation | 20 dia. |
| 3 | Probable office building, four stories high, with small stack | 165 x 50 |
| 4 | Probable laboratory and control building, four stories high, with three vents on roof | 165 x 50 |
| 5 | Unidentified structure | 100 x 30 |
| 6 | Reactor building under construction | 350 x 120 |
| 7 | Location for second reactor, foundations started | ---- |
| 8 | Turbo-generator hall, 100 feet high, with monitor roof, under construction | 350 x 120 |
| 9 | Location for second turbo-generator hall, foundations started | ---- |
| 10 | Cooling water pumping and treatment facility under construction. Bottom of excavation | 200 x 120 |
| 11 | Cooling water intake pipes |  |
| 12 | Cooling water outlet conduits |  |
| 13 | Excavation, possible site of retention basin, diameter across top | 225 |
| 14 | Hip-roofed building | 140 x 45 |
| 15 | Multi-story flat-roofed building, with lower and narrower extension | 130 x 50 100 x 40 |
| 16 | Gable-roofed building | 220 x 40 |
| 17 | Gable-roofed building | 160 x 40 |
| 18 | Gable-roofed building | 220 x 40 |
| 19 | Gable-roofed building | 325 x 40 |
| 20 | Gable-roofed building | 150 x 40 |
| 21 | Gable-roofed building | 150 x 40 |
| 22 | Gable-roofed building | 100 x 40 |
| 23 | Concrete batch plant | ---- |
| 24 | Possible radioactive waste storage area with one building and a partially buried tank | 60 x 35 45 dia. |
| 25 | Multi-story flat-roofed building | 130 x 35 |
| 26 | Multi-story building | 140 x 45 |
| 27 | Probable administration or support building, T-shaped | bar 140 x 40 stem 75 x 40 |
| 28 | Probable storage building, gable-roofed | 115 x 40 |
| 29 | Gable-roofed building | 45 x 35 |
| 30 | Steam plant, with adjacent stack | 90 x 60 |
| 31 | Probable storage building, T-shaped | bar 140 x 40 stem 40 x 100 |
| 32 | Probable storage or shop building | 130 x 50 |
| 33 | Exhaust stack | 450 high |

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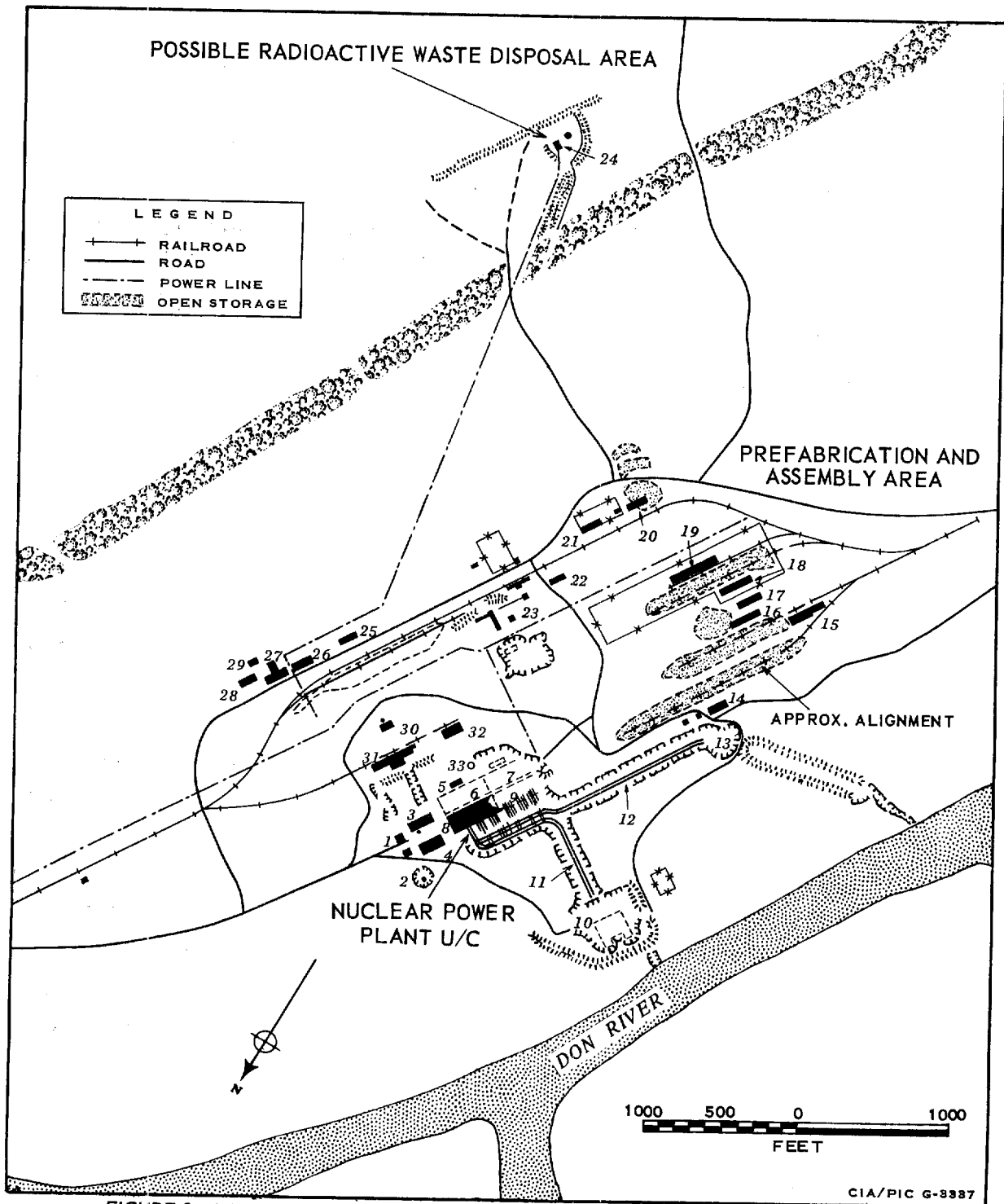


FIGURE 3. LAYOUT OF FACILITIES AT THE VORONEZH NUCLEAR POWER PLANT.

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There are a number of other buildings in the plant area which probably serve administrative, storage, and other support functions for the construction activities.

Security provisions appear to be very limited. The only fences present are those around portions of the storage areas.

Electrical power for the construction activities is supplied through a power line entering the site from the direction of Novovoronezh. The steam plant on the site does not appear to produce any electrical power, and is probably for heating purposes only.

A transformer yard for the nuclear power plant had not been started at the time of the photography.

KEY STRUCTURES

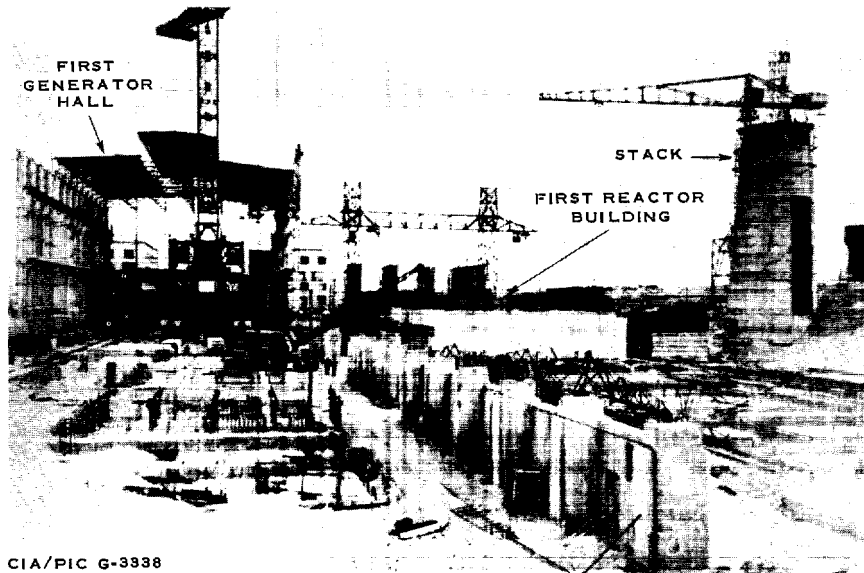
The layout of the plant area is shown in Figure 3, and a brief description of the individual facilities is given in the accompanying table. Item numbers in the table correspond to numbers on Figure 3. All measurements are approximate.

The main buildings of the power plant are, or will be, located at Items 6 through 9. Item 6 is the first reactor building under construction, and Item 8 is the first turbogenerator hall, a monitor-roofed building 350 by 120 feet and 100 feet high. The outer shell of the generator hall is nearing completion. The foundations for the second reactor and generator hall (Items 7 and 9) have been started adjacent to the first unit. A ground view of these facilities as of [REDACTED] is shown in Figure 4. According to reports, the second unit will not be completed until after some operating experience has been obtained from the first reactor. 1/4/5/ These reports indicate that the first unit is scheduled to be completed in the latter part of 1961.

A tall exhaust stack (Item 33), approximately 450 feet high, has been completed. It appears that the one stack will serve both reactors.

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FIGURE 4. CONSTRUCTION ACTIVITY AT THE VORONEZH PLANT. The foundations for the second generator hall and second reactor building are in the foreground. Date of photography [REDACTED]

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FIGURE 5. PART OF WATER INTAKE AND OUTLET SYSTEM UNDER CONSTRUCTION. The intake pipes are approximately 6 feet in diameter, and the sections of outlet conduit are approximately 7 feet square. Date of photography [REDACTED]

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Buildings 3 and 4 probably contain office, laboratory and control facilities. Each building has four stories and is approximately 165 x 30 feet. Building 3 has a small stack adjacent to it and Building 4 has three vents on the roof.

A large excavation (Item 10) near the bank of the Don River will probably contain the pumping and treatment facilities for the condenser-cooling water. The foundations for these facilities apparently are being laid in the excavation. Two water pipes are in place from the edge of the excavation to the power plant. The outlet conduits are also in place from the power plant to an excavation (Item 13) which, when completed, will probably be used as a retention basin. Extending from this point toward the river are two parallel earthen embankments which may also serve as a retention basin. Pipes which will connect the turbogenerators to the main intake and outlet system have been laid loosely in place. These consist of a set of four pipes for each turbogenerator, including pipes for the three turbogenerators which will be installed in the second generator hall. Only one set of pipes has been connected to the intake and outlet system. Figure 5 shows the water system and the generator hall as they appeared in [REDACTED]

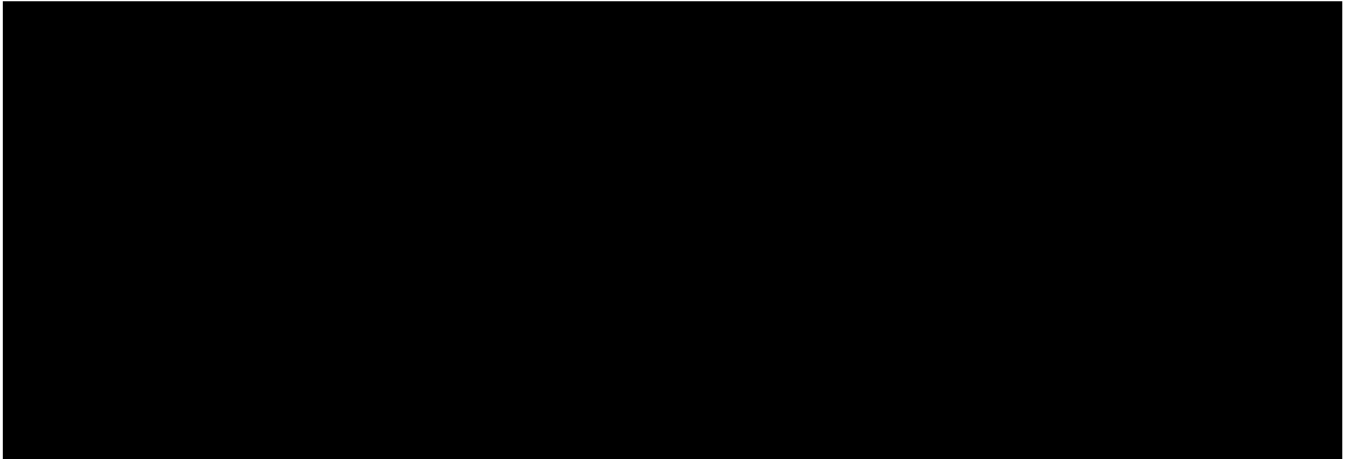
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25X1D [REDACTED] An excavation located approximately 350 feet north of the first generator hall contains a tank approximately 20 feet in diameter (see Figure 3, Item 2). The purpose of the tank is unknown, but it could be used for storage of radioactive liquid wastes.

An isolated facility (Item 24), which may be for radioactive waste disposal, is located approximately 4,400 feet southeast of the first reactor building. The facility contains a gable-roofed building, 60 x 35 feet, and a tank, 45 feet in diameter, which appears to be partially buried. A power line serves the facility, and two open ditches, probably for pipe lines, extend from the facility toward the main plant area.

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REFERENCES

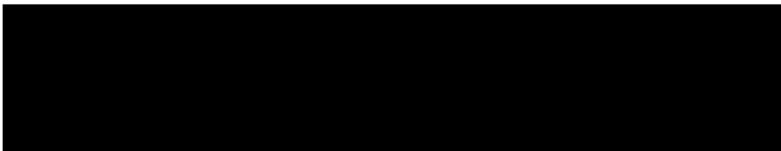


MAPS or CHARTS

AMS. Series N501, Sheet NM 37-2 (Voronezh), 2d Ed, Oct 58, scale 1:250,000 (U)

DOCUMENTS

1. Edison Electric Institute, A Report on USSR Electric Power Developments, 1958-1959, New York, Jan 60 (U)
2. Air, AFCIN 1A1. IR 1255571, 20 Feb 59 (U)



REQUIREMENT Prepared in answer to PIC/SI/R-31/60, requesting a photographic analysis of the Voronezh Nuclear Power Plant, including dimensions of the main facilities, accompanied by appropriate graphic aids.

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